

# The Framingham Circuit

Newsletter of the Framingham Amateur Radio Association November 1999, Vol. 66, No. 11

## In This Issue

President's Message

Digital Concepts for the Millennium

[Page 2-](#)

FARA Takes Down a Tower

QSL Card

[Page 3-](#)

Cushcraft A3 back in Action

By Peter, KA1AXY

and more...

## President's Message

It's beginning to get a bit chilly outside, time to get that fall antenna work done. Otherwise, it will be so cold you can't tell whether you're still holding the tools or not! Besides, it's easier to get those dipoles up in the trees when there are no leaves to block your view.

I already have one person interested in kit building this winter, there must be a couple more of you out there who would like to build your own HF regen receiver from scratch. I'll be building my own and we'll be learning together. The Desert Ratt III is a design by Paul Harden, NASN, and has been built by people on the internet QRP mailing list. Total parts cost should be in the \$10 to \$15 range, you supply your own enclosure (something from Radio Shack would be fine). It's a very buildable design, and I'll guarantee, as always, that your efforts will be successful.

You will notice that we're accepting bids on the two tube HF amps the club owns. We are going to take the profits from their sale, and buy a contest-class amp, probably something like a SB-220. Our goal is to have a fairly robust amp so people aren't afraid to use it. This is not the case with the current equipment.

W1RH has done a great job of scheduling the meetings. December's meeting will have a special guest, Mr. Vince Kajunski, of the Boston FCC office. We will be discussing club finances and the costs of running FARA at the January meeting, so I urge you all to attend.

73,

Peter, KA1AXY

Digital Concepts for the Millennium

By Ed, W1NXC

## Thursday, Nov 4 This Month's Meeting

Get ready to make out your wish list for the upcoming holiday season because this month we will have a representative from Ham Radio Outlet to show off the latest gadgets.

With the current interest in analog-to-digital conversions (see Bob W1RH's article in the October issue of The Circuit) it becomes necessary to concern ourselves with the introduction of random noise which intrudes at the junction of the analog-digital interface. The elimination of so-called low-end noise can be particularly troublesome but some limited success has been achieved by employing Trellis coding, equipped with a non-coherent phase quantizer to minimize arbitrary Gaussian interference.

While the intrusion of any type of noise in the analog-to-digital conversion process is a problem that must be dealt with, control of the avalanche gain and quantum efficiency of the junction is of prime importance. This calls for careful analysis and design of the asynchronous control interface adapter (ACIA). It may even become necessary to develop an algorithm of the parabolic regression of the noise source, using an arbitrary Nyquist spectrum to assist in the diagnostic differentiation of the average signal distribution.

Although most amateurs are familiar with noise mitigation procedures, in some instances random phase modulation or jitter is more annoying. This is usually the result of digital circuitry that exhibits a non-uniform quantizer transfer characteristic. It is often necessary to modify the bipolar timing signals which would allow the framing code to block any intersymbol pulses from interfering with the logic circuits. In very severe cases it may even be required to provide redundant interface units which could be controlled by an integrated nodal timing supply.

Finally it should be recognized that at the receiving end of digital circuits, the inverse of the processes used at the transmitting end must be provided, and very careful attention must be employed to minimize degradation of any kind at the analog-digital interface. It is

...Continued from page 1

## Submitting Material to the Circuit

Material may be submitted for publication by sending it directly to the editor. This can be done by phone, by US Mail, or via the Internet (preferred).

The deadline

for each issue is the **Wednesday**, one week before the monthly meeting.

### by phone

Home

(508) 435-2055 (before 9:00PM please!)

College

(508) 910-5296

### by mail

Robert Hess, N1UVA

1 Cold Spring Brook Road

Hopkinton, MA 01748

### by Internet

[n1uva@ultranet.com](mailto:n1uva@ultranet.com)

important to note also that in addition to noise problems, non-linear distortion must be dealt with, especially where alternate voice/data using companded channels is used.

In that instance, the only remedy recommended is the re-design of the substrate data multiplexer using isosynchronous rather than non-synchronous feedback.

For additional information on this topic: visit [www.technobabble.com](http://www.technobabble.com) (click on help).

#### Kit Building

By Peter, KA1AXY

This fall, I'd like to try something different. We'll be building the **NA5N Desert Ratt 3 Regen Receiver**, and we'll be building it from scratch! Parts cost should be in the \$10 - \$20 range. We'll build on bare PCB material, and all parts necessary for a working receiver will be supplied. I'm still working out the details, but if you're interested in building a shortwave regenerative receiver (6.6 - 15 MHz) from R's, C's, Q's and some wire, let me know!

[FraminghamARA-L@qth.net](mailto:FraminghamARA-L@qth.net)

The FARA email reflector is working well. It provides us with an easy way to reach all our members who have email. You have to sign up for it to reach you, though. See the instructions on the FARA web page, and remember that, once you sign up, anything you send must come from the address you signed up with. If you change email addresses, you won't be able to post until you repeat the signup process from your new address.

**READ THE CIRCUIT ONLINE...**  
**SAVES PAPER AND POSTAGE.**  
 Now available as an Adobe Acrobat file email [fara@fara.org](mailto:fara@fara.org) and we'll set you

#### FARA takes down a tower in Franklin

By Peter, KA1AXY

One of Sharon's co-workers had recently bought a house with an old CB antenna attached. He was generous enough to ask FARA if they wanted it. Summer, John and I went over to take it down. Unfortunately, the tower and CB quad were pretty old, so John, KA1ALT ended up carting most of it to the metal recycling station, but did end up with a useable boom for his 6-meter beam.

The big thank-you goes to the guy across the street, though. He works for a cable company, and was kind enough to drive his bucket truck over and do most of the work of taking the quad and tower apart (with instructions from FARA members).

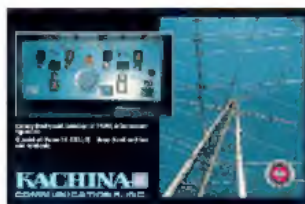


#### QSL Card

Submitted by Lew, K1AZE



*If you would like to share your favorite QSL card, which could be your own, with the club, please send it my way! A caption or story would be appreciated also.*

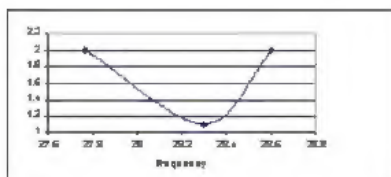
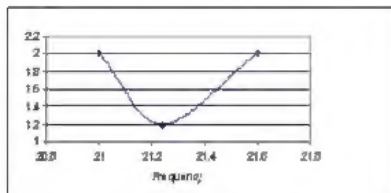
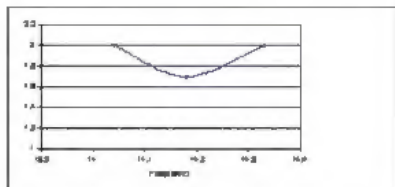


**Don't Miss an Issue!**  
**(Y2K dues are now payable)**  
 You won't get the January Circuit unless we receive your 2000 dues before December 15th.

## Cushcraft A3 back in Action

By Peter KA1AXY

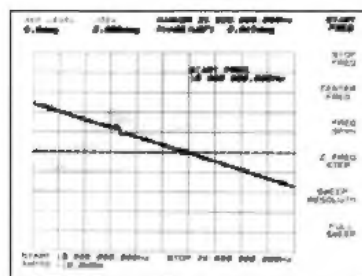
The beam down at the shack is finally back in working order. Thanks to Bob, W1RH, and his antenna analyzer, we have a set of curves that prove we have restored the beam to its original specs (SWR below 2:1 over 500 KHz on all 3 bands). Although, it does look like 20m could use a bit of tweaking.



It wasn't all easy, though. We suspected that the 15 meter traps had been "scrambled", but didn't know quite how to prove it. Dave, K1HT, came to our rescue with a posting which explained how to identify the two varieties of traps, using a network analyzer. Network analyzers are very expensive pieces of test equipment, but, fortunately, I have one at work. All of us who work in the lab are hams, so when I wanted to hook the traps up and test them, I had to fight off the helpers!



The first photo shows a trap being tested, and the second photo shows the phase versus frequency plot.



The resonance point is the frequency where the phase goes through zero (where the sloped line intersects the dotted line). When you position the cursor at this point, you can read the frequency (and the phase value) at the top of the display. Director 15-meter traps resonate about 150 KHz higher than reflector and driven element traps. All traps on both club A3s have been identified and marked.

### Membership Dues

Annual membership dues are as follows: (Make checks payable to FARA)  
 Regular FARA \$10  
 Student / Retired \$5  
 Repeater (voluntary) \$10

### FARA Horizons

Nov 4: Monthly Meeting  
 Nov 29: Board Meeting